

Flexibility & Mobility to Prevent Injury to the Adolescent Athlete

Cause of Injury to the Adolescent Athlete

Although the rate of injury in adolescents is similar to that of adult professionals, injuries that affect high school athletes are slightly different. This is largely because high school athletes are often still growing. Not only do young athletes have to make adjustments in their movement to accommodate their bodies changing environment, it is common for bones, muscles and tendons to exhibit an uneven growth pattern (each tissues growing at a different rate) which makes them more susceptible to various injuries.

Types of Injuries

Overuse and acute injuries are the most common types of injuries seen in adolescent athletes.

Acute Injuries: injuries caused by a sudden trauma. Examples of trauma include collisions with obstacles on the field or between players resulting in contusions (bruises), sprains (a partial or complete tear of a ligament), strains (a partial or complete tear of a muscle or tendon), and fractures.

Overuse Injuries: occur gradually over time, when an athletic activity is repeated so often, parts of the body do not have enough time to heal between playing. This type of injury can affect muscles, ligaments, tendons, bones, and growth plates.

Flexibility and Mobility Defined

Both flexibility and mobility are important components in any youth fitness training program, whether for specific to the athlete or those who want to be physically fit.

Mobility: range of motion for a specific movement. For example: spinal stabilization and hip mobility are directly related to quality and depth of a squat or lunge or moving from one position into another during a run or drill.

From IYCA.org: "I think of mobility like this: Tissue length + neural control/stability + joint architecture = Mobility"

Flexibility: Flexibility is often considered a component of mobility and is the ability of a muscle to lengthen during passive movement and the resulting range of motion around the related joint. ie: lengthening of the hamstrings during the sit and reach test.

Mobility

Use of these exercises solely with body weight are effective for developing coordination, strength, mobility, and stability in youth.

- Lunges: forward, backward, lateral, and other multi directional lunges
- Push-Ups: technically correct push ups are very challenging for the young athlete (adults too!). For a technically correct push up, the pelvis stays neutral, the spine remains straight, and the nose nearly touches

the ground.

- Squats: squats require specific motor patterns and mobility of the ankles, hips, and spine. An athlete should be able squat until their thighs are parallel to the ground and then stand up without falling backward.
- Pull-ups and horizontal Pull-Ups: young athletes can often struggle with standard pull ups. Using a bar fixed about 3 feet off the ground, the athlete hangs from the bar with legs straight and pulls until their chest makes contact.

The listed exercises are a brief summary of movements used to improve overall mobility in the young athlete. Success of each movement can be achieved by coaches and parents watching closely to ensure the athlete is performing movements in a technically correct manner.

Flexibility

Stretching before athletic activity helps prepare the muscles for exercise. Stretching after exercise has proven to be even more important for preventing injury. For maximum benefit, young athletes should stretch each of the major lower body muscle groups before and after sporting activity.

Types of stretches: this is an excerpt taken directly from “Full-Body Flexibility, Second Edition” by Jay Blahnik

- **Dynamic stretching** - Dynamic stretching means a stretch is performed by moving through a challenging but comfortable range of motion repeatedly, usually 10 to 12 times. Although dynamic stretching requires more thoughtful coordination than static stretching (because of the movement involved), it is gaining favor among athletes, coaches, trainers, and physical therapists because of its apparent benefits in improving functional range of motion and mobility in sports and activities for daily living. **Beneficial for all ages and recommended for females under 12-13 and males under 14 years of age.**
- **Active stretching** - Active stretching means you're stretching a muscle by actively contracting the muscle in opposition to the one you're stretching. You do not use your body weight, a strap, leverage, gravity, another person, or a stretching device. With active stretching, you relax the muscle you're trying to stretch and rely on the opposing muscle to initiate the stretch.
- **Passive (or relaxed) stretching** - Passive stretching means you're using some sort of outside assistance to help you achieve a stretch. This assistance could be your body weight, a strap, leverage, gravity, another person, or a stretching device. With passive stretching, you relax the muscle you're trying to stretch and rely on the external force to hold you in place
- **Static stretching:** Static stretching means a stretch is held in a challenging but comfortable position for a period of time, usually somewhere between 10 to 30 seconds. Static stretching is the most common form of stretching found in general fitness and is considered safe and effective for improving overall flexibility. **Recommended for females over 12-13 and males over 13-14.**

You might hear or read about other techniques and terms used in stretching (especially by coaches and

athletes), such as proprioceptive neuromuscular facilitation (PNF) stretching or active isolated stretching. These techniques are all simply variations of these four types of stretches.

FOR YOUNGER ATHLETES: The IYCA recommends use of dynamic stretching and as the main method of developing flexibility with most of young athletes from as young as 6 years old and integrating other forms of stretching after the age of 12-13 in females and 13-14 in males.

Basic Flexibility Program

- Warm up before doing any of these stretches
- Perform the stretches carefully without rushing. Allow your natural range of motion to determine how far you stretch. Do not bounce a stretch as it can lead to muscle strains and other injuries.

Forward Lunges



- Kneel on the left leg, placing the right leg forward at a right angle. Lunge forward, keeping the back straight. Stretch should be felt on the left groin.
- Hold for 10-60 seconds
- Repeat on opposite leg.

Side Lunges



- Stand with legs apart, bending the left knee while leaning toward the left. Keep the back straight and the right leg straight.
- Hold for 10-60 seconds
- Repeat on opposite leg.

Cross-Over



- Stand with legs crossed, keeping the feet close together and the legs straight. Try to touch the toes.
- Hold for 10-60 seconds
- Repeat with the opposite leg.

Standing Quad Stretch



- Stand supported by holding onto a wall or chair. Pull the foot behind to the buttocks. Try to keep knees close together.
- Hold for 10-60 seconds
- Repeat with the opposite leg

Seat Straddle Lotus



- Sit down, placing the soles of the feet together and drop the knees toward floor. Place the forearms on the inside of the knees and push the knees toward the ground. Lean forward from the hips.
- Hold for 10-60 seconds

Seat Side Straddle



- Sit with legs spread, placing both hands on the same shin or ankle. Bring the chin toward the knee, keeping the leg straight.
- Hold for 10-60 seconds
- Repeat exercise on the opposite leg.

Seat Stretch



- Sit with the legs together, feet flexed, and hands on the shins or ankles. Bring the chin toward the knees.
- Hold for 10-60 seconds

Knees to Chest



- Lie on the back with knees bent. Grasp the tops of knees and bring them out toward the armpits, rocking gently.
- Hold for 10-60 seconds
- Repeat three to five times.

Prevention

Many high school sports injuries can be prevented through proper conditioning, training, and equipment. Implementing a regular and effective flexibility program while also analyzing and working to improve each athletes mobility together with an appropriate conditioning program that begins prior to the formal sports season is the best approach to reducing the rate of injury in young athletes.

Observation and correction of:

- Overall mobility
- Flexibility
- Posture
- Running gait
- Knee tracking

are a some key points coaches and parents can focus on when developing injury prevention strategies.

Sources

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Presenter

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